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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/753,942	12/27/2000	Arkady S. Bablumyan	2807.2.16.1	3107

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ALL OPTICAL NETWORKS, INC.
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EXAMINER

ANGEBRANDT, MARTIN J

ART UNIT	PAPER NUMBER
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1756

DATE MAILED: 09/24/2002

7

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/753,942

Applicant(s)

BABLUMYAN, ARKADY S.

Examiner

Martin J Angebrannt

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 July 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-29 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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1. The applicant should change the title and abstract to reflect the claimed invention.
2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-29 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Please replace "photonic" with - - coherent light - - .

Please delete the "arbitrary" language. It only adds confusion to the claims, not breadth.

Please amend claim 1 to make it clear that this process uses a portable holographic recording apparatus and that the "re-locating" step is moving the entire frame including first light source and the photoreactive material to another location or position. If the first wavefront is the reference beam, then this should be made clear.

In claim 2, please amend the claims to indicate that the photo-reactive material is reacting with a developer.

In claim 4, please indicate that first and second light sources are first and second input apertures in the frame and that the light is generated remotely by a laser and guided to the first and second input apertures.

In claims 5 and 6, these claims should indicate that - - fiber optics - - are used to guide the light from the laser to the first and second input apertures and that the end face of the fiber acts as the aperture.

Claim 7 should be deleted as it adds nothing the claims.

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Claim 8 should be deleted as superfluous as otherwise the hologram would not be formed in claim 1. (see specification at 32/4-6)

Claim 11, should replace "registration monument" with - - self-registering mount- - .

In claim 12, please replace "providing" with - - recording - - as a second hologram is being formed/recorded in the photo-reactive material.

In claims 12 and 13, should this hologram be formed in the same photo-reactive material, but in different positions on that photo-reactive material ? see figure 14 and discussion beginning on page 30.

In claim 14, should the claims indicate that the (first) hologram is a holographic lens ?

In claim 16, should the claims indicate that the (second) hologram is a holographic lens ?

In claim 17, this should be described as a replay process.

In claim 19, the third light source should be described as a replay light source.

In claim 22, the third light source should be described as a replay light source and use similar language to that described above with respect to claim 4. Shouldn't this refer to the third wavefront, rather than the first ?

Claim 23 adds nothing to claim 20 upon which it depends. (the fourth wavefront is the reconstructed/replayed wavefront)

Claims 22-29 seem to have some conflicts, particularly, in claim 22, the photonic interface surface is coupled to a source and in claims 24 and 25, it seems that light is coupled into it from the other direction form a hologram. Please clarify.

Claim 28 should be deleted as it adds nothing the claims (change dependency of claim 29).

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4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1,10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki et al. 726, in view of McGrew '030, Cowan '234 and Horst et al. '939.

Suzuki et al. 726 teaches a holographic camera in figure 1, where the laser (11), reference beam (RL) and holographic recording medium (20) are enclosed inside a case (10) and the object is outside the case with the object beam light (OL) being reflected off of the object (O) and into the case. Photographic film is used to recording the hologram. The adjustment of the optical path length (and hence the relative phase) of the beams is disclosed. (5/1-6/14)

McGrew '030 teaches multiplexed holograms where multiple holograms are stored in the same holographic medium. (9/18-62)

Cowan '234 teaches multiple holographic exposures to form a VPR hologram. The use of positive resists is disclosed (3/47-57). The use of two exposures with development to remove portions of the photoresist layer is disclosed. (7/43-8/27).

Horst et al. '939 teach forming diffraction grating patterns using multiple exposures of the grating patterns (6/45-54 and 7/1-7) with development of the positive resist between these exposures. The importance of registration for the various exposures is disclosed (4/40-5/12). The AZ resists are positive photoresists and can be exposed and redeveloped after exposure (5/56-61). The process with development between the exposure results in increased sharpness,

definition. (7/15-23). Gratings are interferometric/diffractive articles and are holographic mirrors.

It would have been obvious to one skilled in the art to modify the process of Suzuki et al. 726 to increase the information content of the holographic recording medium by recording multiple holograms of objects located at different locations in a photoresist based holographic recording medium, based upon the direction within McGrew '030 and to develop the photoresist between exposures as taught by Cowan '234 and Horst et al. '939 to increase the sharpness of the resultant images.

The language "the frame continually maintaining in registration the first wavefront and the first hologram with respect to each other" has been interpreted by the examiner as requiring the wavefront and first hologram being maintained in position and orientation with respect to each other during the entire movement/relocation step.

6. Claims 1 and 10-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki et al. 726, in view of McGrew '030, Cowan '234, Horst et al. '939 and Eaglefield '641.

Eaglefield '641 teaches that holograms can be multiplexed using variation in phase between the exposures. The reference beam is varied in its phase to allow selective readout of the holographic images.

In addition to the basis provided above, the examiner holds that it would have been obvious to modify the process of Suzuki et al. 726, combined with McGrew '030, Cowan '234 and Horst et al. '939 by using other multiplexing techniques, such as that disclosed by Eaglefield '641 with a reasonable expectation of achieving comparable results in storing multiplexed holographic information.

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7. Claims 1-3 and 10-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki et al. 726, in view of McGrew '030, Cowan '234, Horst et al. '939 and Eaglefield '641 and Heise et al. '548.

Heise et al. '548 teach with respect to figure 5, the recording of a holographic grating while in contact with a developer/etchant. (5/46-6/11).

In addition to the basis provided above, the examiner holds that it would have been obvious to modify the invention of Suzuki et al. 726, combined with McGrew '030, Cowan '234, Horst et al. '939 and Eaglefield '641 by having the laser remote, but fixed relative to the holographic recording device and to submerge the holographic recording device during development and/or recording as this is old and well known in the art as evidenced by Heise et al. '548.

8. Claims 1-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki et al. 726, in view of McGrew '030, Cowan '234, Horst et al. '939, Eaglefield '641 and Heise et al. '548, further in view of Deason et al. '951 and Hayakawa et al. JP 57-190985.

Deason et al. '951 teaches the use of fiber optics (53,55,57) to convey the laser light from the laser (50) to the holographic grating recording device. The use of the fiber optics increases the accuracy of alignment, particularly with double exposure processes (1/37-63). The formation of holographic lenses is disclosed as particularly desirable due to the reduced weight relative to other lens types. (2/1-5).

Hayakawa et al. JP 57-190985 teaches portable holographic recording devices such as that shown in figure 2a, where the laser source is remote (20 is the laser light) and fiber optics

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are used to convey the reference (24) and object light (24) to the photosensitive material (28).

See also figure 2b.

In addition to the basis provided above, the examiner holds that it would have been obvious to one skilled in the art to modify the process of Suzuki et al. 726 as combined with McGrew '030, Cowan '234, Horst et al. '939, Eaglefield '641 and Heise et al. '548 by using fiber optics in place of a laser and beam steering equipment inside the case to simplify the alignment and allow imaging of remote objects as taught by Deason et al. '951 and Hayakawa et al. JP 57-190985.

With respect to claims 20-29, the use of reversal of the (reference) beams to replay the hologram(s) is entirely conventional within the art to reverse the replay beam to have the real object image replay at the same distance and side of the hologram as the original object, rather than on the opposite side of the hologram from the original.

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

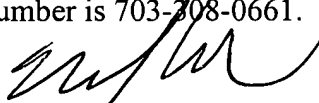
Horan '461, Caulfield et al., " Wide field of view transmission holography", Opt. Commun. Vol. 86 pp. 487-490 (1991), Close, D.H., "High resolution portable holocamera", Appl. Opt., Vol. 11(2) pp. 376-383 (1972) and Jacoby et al. '427 each teach portable holographic devices and are considered cumulative.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Martin J Angebrannndt whose telephone number is 703-308-4397. The examiner can normally be reached on Mondays-Thursday and alternate Fridays.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on 703-308-2464. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.



Martin J Angebrannndt
Primary Examiner
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September 23, 2002